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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,170	10/06/2003	David Joseph Kropaczek	24GA6001	2278

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EXAMINER	
GARCIA OTERO, EDUARDO	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 02/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/678,170	KROPACZEK ET AL.	
	Examiner	Art Unit	
	Eduardo Garcia-Otero	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION: Non-Final (first action on the merits)

Introduction

1. Title is: METHOD AND APPARATUS FOR FACILITATING RECOVERY OF NUCLEAR FUEL FROM A FUEL POOL.

2. First listed inventor is: Kropaczek.

3. Claims 1-32 are pending.

4. US Application received 10/6/03, and no earlier priority is claimed.

5. Applicant's Response to Restriction Requirement was received 1/7/2005, which elected to prosecute Group I including claims 1-32.

Index of Important Prior Art

6. Russell'348 refers to US Patent 6,748,348.

7. Russell'437 refers to US Patent 6,404,437.

8. Glasstone refers to Nuclear Reactor Engineering, Third Edition, by Samuel Glasstone and Alexander Sesonske, Van Nostrand Reinhold, 1981, Nuclear Fuel Management at pages 528-534

35 USC § 112-Second Paragraph-indefinite claims

9. The following is a quotation of the second paragraph of 35 U.S.C. 112: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. In claim 4, the term "fuel bundle pedigree, which is a parameter that reflects usability of the fuel bundle for continued reactor operation" is not definite. The discussion at Specification page 22 ("might be...") is not adequate.

Claim Rejections - 35 USC § 102(b)

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action: A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 19 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated.

14. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Glasstone.

15. Independent claim 19 is a "method" claim.

16. In claim 19, **"selectively populating a loading map with fuel bundles residing in at least one fuel pool"** is disclosed by Glasstone page 530-535 "Various methods have been considered for fuel loading, unloading, and distribution schedules...". Also see FIG 8.14 at page 533, and FIG 8.15 at page 534. Note that fuel bundles are radioactive, and thus are stored underwater in fuel pools. Further, note that radioactive materials are strictly controlled, and thus it is inherent that databases of the fuel bundles and their properties are maintained. This is particularly true for radioactive materials that have weapons applications such as the enriched uranium in nuclear reactors, and such as the plutonium in used bundles. The nuclear power industry in the United States is extremely regulated.

17. Claims 20-31 depend from independent claim 19, and are rejected below under 35 USC 103.

18. Claim 32 is rejected under 35 U.S.C. 102(b) as being anticipated by Glasstone.

19. In claim 32, **"using nuclear fuel bundles residing in at least one fuel pool in a new loading map for a nuclear reactor"** is disclosed by Glasstone page 530-535 "Various methods have been considered for fuel loading, unloading, and distribution schedules...". Also see FIG 8.14 at page 533, and FIG 8.15 at page 534. Note that fuel bundles are radioactive, and thus are stored underwater in fuel pools. Further, note that radioactive materials are strictly controlled, and thus it is inherent that databases of the fuel bundles and their properties are maintained. This is particularly true for radioactive materials that have weapons applications such as the enriched uranium in nuclear reactors, and such as the plutonium in used bundles. The nuclear power industry in the United States is extremely regulated.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

21. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: Determining the scope and contents of the prior art. Ascertaining the differences between the prior art and the claims at issue. Resolving the level of ordinary skill in the pertinent art. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. Claims 1-18, and 20-31 are rejected under 35 U.S.C. 103(a) as being unpatentable.

23. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glasstone in view of Russell'437.

24. Independent claim 1 is a "method" claim.

25. In claim 1, **"selectively populate a loading map with fuel bundles residing in at least one fuel pool"** is disclosed by Glasstone page 530-535 "Various methods have been considered for fuel loading, unloading, and distribution schedules...". Also see FIG 8.14 at page 533, and FIG 8.15 at page 534. Note that fuel bundles are radioactive, and thus are stored underwater in fuel pools. Further, note that radioactive materials are strictly controlled, and thus it is inherent that databases of the fuel bundles and their properties are maintained. This is particularly true for radioactive materials that have weapons applications such as the enriched uranium in nuclear reactors, and such as the plutonium in used bundles. The nuclear power industry in the United States is extremely regulated.

26. The additional limitation is not explicitly disclosed by Glasstone.

27. Also in claim 1, **"providing a graphical user interface"** is disclosed by Russell'437 Abstract "A nuclear reactor core performance visualization system" and FIG 1 "Virtual Core Modeling".

28. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Russell'437 to modify Glasstone. One of ordinary skill in the art would have been motivated to graphically display the loading map in order to more clearly present the loading input as well as the resulting data from simulating the "Various methods" of Glasstone. Note that using graphical user interfaces is implicit in Glasstone due to the computationally intensive requirements of stochastic nuclear reactor

design. However, Russell'437 is presented because it explicitly emphasizes the "digital image animation files for displaying dynamic color coded graphics" at Abstract, and the high speed microprocessors required for this type of animation were not available in 1981 when Glasstone was written. Such advanced graphical interfaces are common by 1999 when Russell'437 was filed. Also see Glasstone page 528 "decisions are possible at various stages in the fuel cycle that will affect fuel costs or utilization". Also see Specification page 2 regarding NRC "licensed simulation program".

29. Claims 2-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glasstone in view of Russell'437 and Russell'348 and MPEP 2144.04.

30. Claims 2-18 depend from independent claim 1.

31. In claim 2, **"storing at least one fuel pool database, the fuel pool database including a list of at least a portion of the fuel bundles residing in the fuel pool"** is disclosed by Glasstone page 530-535 "Various methods have been considered for fuel loading, unloading, and distribution schedules...". Also see FIG 8.14 at page 533, and FIG 8.15 at page 534. Note that fuel bundles are radioactive, and thus are stored underwater in fuel pools. Further, note that radioactive materials are strictly controlled, and thus it is inherent that databases of the fuel bundles and their properties are maintained. This is particularly true for radioactive materials that have weapons applications such as the enriched uranium in nuclear reactors, and such as the plutonium in used bundles. The nuclear power industry in the United States is extremely regulated.

32. Also in claim 2, **"graphical user interface that allows the user to select fuel bundles from the fuel pool database to populate the loading map"** is disclosed by Russell'437 Abstract "A nuclear reactor core performance visualization system" and FIG 1 "Virtual Core Modeling".

33. In claim 3, **"the fuel pool database indicates one or more attributes for the listed fuel bundles"** is disclosed by Glasstone page 532 "assemblies with three different enrichments".

34. In claim 4, **"attributes include..."** is disclosed by Glasstone page 532 "assemblies with three different enrichments".

35. In claim 5, **"fuel database management tools"** is disclosed by Russell'437 Abstract "A nuclear reactor core performance visualization system" and FIG 1 "Virtual Core Modeling" and FIG 3.

36. In claim 6, **"database indicates one or more attributes for the listed fuel bundles"** is disclosed by Glasstone page 532 "assemblies with three different enrichments".

37. Also in claim 6, **"database management tools includes filtering the listed fuel bundles according to at least one of the attributes"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

38. In claim 7, **"database management tools includes** sorting" is disclosed by Russell'348 FIG 4 "determine and sort bundles by reactivity value".

39. In claim 8, **"one or more loading tools"** is disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

40. In claim 9, **"user to selectively populate the loading map with different types of fresh fuel bundles"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

41. In claim 10, **"storing at least one fresh bundle type database"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

42. Also in claim 10, **"select... to populate the loading map"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

43. In claim 11, **"database indicates one or more attributes for the listed fresh fuel bundle types"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

44. In claim 12, **"the attributes include at least one of "** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

45. In claim 13, **"fresh bundle type database management tools for aiding in the fresh bundle type selection process"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

46. In claim 14, **"one or more attributes for the listed fresh fuel bundle types"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

47. Also in claim 14, **"includes filtering the listed fresh fuel bundle types according to at least one of the attributes"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module" and Russell'348 FIG 4 "determine and sort bundles".

48. In claim 15, **"indicates one or more attributes for the listed fresh fuel bundle types"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

49. Also in claim 15, **"sorting the listed fresh fuel bundle types"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module" and Russell'348 FIG 4 "determine and sort bundles".

50. In claim 16, **"fresh bundle type loading tools"** is disclosed by Glasstone page 532 "assemblies with three different enrichments", and disclosed by Russell'348 "fuel bundle loading module" and "bundle characteristics module".

51. In claim 17, **"at least one of the fuel pools is a fuel pool for more than one reactor core"** is disclosed by MPEP 2144.04(VI)(B). *In re Harza*, 274 F.2d 669, 124 USPQ 378, 380 (CCPA 1960) states "It is well settled that the mere duplication of parts

has no patentable significance unless a new and unexpected result is produced". Specifically, using a single fuel pool to serve more than one reactor core is a mere duplication of parts without any new or unexpected results. Rather, using a single fuel pool to serve more than one reactor core is obvious in order to gain economies of scale (a single large fuel pool) at a location with multiple nuclear reactors.

52. In claim 18, **"fuel bundles residing in more than one fuel pool"** is disclosed by MPEP 2144.04(VI)(B). *In re Harza*, 274 F.2d 669, 124 USPQ 378, 380 (CCPA 1960) states "It is well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced". Specifically, using multiple fuel pools does not produce new or unexpected results.

53. MOTIVATION FOR CLAIMS 2-18. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Russell'437 and Russell'348 and MPEP 2144.04 to modify Glasstone. One of ordinary skill in the art would have been motivated to begin with Glasstone's basic simple nuclear fuel management techniques, and then to facilitate and simulate potential bundle arrangement layouts (loading maps) using the Russell'437 graphics and the Russell'348 modules in order to "decrease the unit energy cost or to more effective utilization of the fuel" per Glasstone page 528. The use of a single pool for multiple reactors, or using multiple fuel pools is a mere duplication of parts without new or unexpected results.

54. Claims 20-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glasstone in view of Russell'437 and Russell'348 and MPEP 2144.04.

55. Claims 20-31 depend from independent claim 19.

56. Claims 20-31 have the same limitations as claims 2-18 discussed above, and thus are rejected for the same reasons.

Conclusion

57. All pending claims stand rejected.

Communication

58. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 571-272-3711. The examiner can normally be reached on Monday through Thursday from

9:00 AM to 8:00 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at 571-272-3761. The fax phone number for this group is 703-872-9306.

* * * *